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UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

AN ANALYSIS OF THE BASE-QUOTA PLAN
IN THE MEMPHIS MILKSHED

By
HANS G. HIRSCH
and
IRWIN R. HEDGES

A study conducted with funds provided
by the Research and Marketing Act.

COOPERATIVE RESEARCH AND SERVICE DIVISION

UNITED STATES DEPARTMENT OF AGRICULTURE
FARM CREDIT ADMINISTRATION
WASHINGTON 25, D. C.
I. W. OUGGAN, GOVERNOR

COOPERATIVE RESEARCH AND SERVICE DIVISION

HAROLD HEDGES, CHIEF

JOSEPH G. KNAPP, ASSOCIATE CHIEF

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SUMMARY AND CONCLUSIONS

The base quota and penalty plan in use in the Memphis, Tennessee, market is designed to bring about a more level pattern of milk production on about 500 dairy farms supplying the market. It provides, first, a lower price for milk not needed for bottling during flush periods and, second, imposes penalties for underproduction during periods when the local supply is insufficient and milk has to be imported.

The Mid-South Milk Producers Association, a bargaining cooperative, administers the plan. The association operates a market-wide milk pool through a producer settlement fund. The cooperative has contracts with the Memphis milk dealers to provide the city milk supply. At any time that the local milk supply is not sufficient the association imports milk to meet the dealers' needs.

Each member-producer has a contract with the association which authorizes the sale and payment of milk according to its use. Milk is classed as Class I and Class II. Class I is milk used for bottling and is paid for at a higher price than Class II which is shrinkage and milk which goes into other less profitable outlets.

The present Bottled Milk Quota Plan has been used in Memphis since May 1947. Four important considerations underlie this plan:

1. A combination of low Class II prices for spring-summer surpluses and penalties for underquota deliveries in the fall-winter, should induce year-round level milk production.
2. The cost of fluid milk imports is borne by the producers who do not come up to their quotas.
3. The dealers' risk tends to be reduced because the association, by means of supply contracts with dealers, has taken over the responsibility of importing most of the milk needed in the market which cannot be supplied locally.
4. If milk imports can be avoided by a more level seasonal production pattern, local producers will receive revenue which otherwise would go to far-away producers and truckers.

Each producer under the plan has a quota which is equal to his average daily milk deliveries from September through February, subject to the qualifications listed below. New quotas are earned each year. However, to get the plan started each producer chose his own initial quota. A producer's quota determines the amount of his milk which will be paid for at the Class I price in the surplus production period. Also, if he fails to deliver his quota during the low production season he must pay the association his proportionate share of the net cost of any fluid milk imported. If Class I sales of milk are less than total deliveries, but in excess of the old quotas, only the old quota deliveries plus a prorated portion of overquota deliveries are allowed as quota credits.

If Class I sales exceed the sum of all quotas, plus actual overquota deliveries, the excess would be prorated and added to the quotas of all

producers, unless volunteers are willing to assume new quotas large enough to make up the deficit. If Class I sales are less than the sum of all quotas, each quota would be decreased proportionately.

During the war years, locally produced milk did not meet consumption requirements. Under these circumstances, the base quota plan that had been adopted in 1942 was ineffective. Milk deliveries during those years showed wide seasonal swings. It was this situation which led to the adoption of a plan aimed not only at seasonal surpluses but, also, at fall-winter shortages.

The first year under the new plan, 1947-48, showed less seasonal fluctuation. There was a greater percentage increase in October, November, and December deliveries over the preceding year than the percentage increase of deliveries during the other months of the year and a smaller seasonal variation in the percentage of dry cows to all cows. The gains in fall milk deliveries during the first year under the new plan were barely held in the fall of 1948.

A sample of 94 producers' penalty records showed that 86 of these producers incurred penalties between September 1947 and March 1948. The average daily deliveries of the 94 producers from September 1947 to March 1948 amounted to 83 percent of their full quotas. Fluid milk imports charged to underquota producers were 5 percent of their original quota. Thus, the quotas for the second year of the 94 producers studied were 88 percent of their original quotas. In no case did the penalty charge exceed 11 percent of net receipts. Six out of 10 penalty charges were less than 1.5 percent of net receipts. The average penalty amounted to 1.59 percent of net receipts. There was no distinct association of penalty charges with amount of quota, although no large penalty charge was associated with a small quota; in the average, each pound of daily quota was associated with a penalty of 17 cents for the entire 7-month import season.

The net cost to a producer for failing to deliver 1 pound of his quota daily from September 1947 through March 1948, 213 pounds of milk, was 98 cents. The difference between 98 cents and \$4.11, the actual net cost of importing 213 pounds of milk, is accounted for by the fact that imports were required for only a fraction of the undelivered quota milk. In other words, the total quota was higher than actual sales and underquota producers were assessed penalties on only about one-fourth of their undelivered quota.

The plan has shifted the burden of the net cost of fluid milk imports from the dealers to the uneven producers whose fluctuating production record makes these imports necessary. Indications are that the plan is an incentive toward more level production. It may thus act to eliminate the need for fluid milk imports in future fall and winter seasons. This will mean a greater gross income to local milk producers.

AN ANALYSIS OF THE BASE-QUOTA PLAN IN THE MEMPHIS MILKSHED

By

Hans G. Hirsch and Irwin R. Hedges
Agricultural Economists

Seasonal fluctuations in milk deliveries create one of the principal problems in fluid milk markets. Fluid milk consumption tends to show only slight seasonal variation. Milk production, on the other hand, varies sharply from fall to spring, on most dairy farms, unless a conscious effort is made to bring about a uniform production pattern. Various pricing plans have been used in fluid milk markets from time to time to induce producers to supply milk more evenly throughout the year. These plans differ considerably in detail but all seek by one means or another to reward dairymen who produce at a more even rate.

This study is an analysis of the base-quota plan in use since 1947 in the Memphis, Tenn., milkshed, which is designed to bring about a more level seasonal pattern of milk production. Under this plan, producers are paid the top price, during the flush season, for only the quantity of milk delivered equal to a quota based on previous fall and winter deliveries. Milk deliveries, in excess of the quota, are paid for at a price that reflects the use made of such overquota deliveries.

Recently, in an effort to strengthen the plan, provisions were added under which producers are made financially responsible for their quotas during the season of low production. If fluid milk imports from outside the milkshed are necessary, because producers fail to deliver their full quotas, these producers must reimburse their association for its net import expenses. This study is directed primarily toward an analysis of these penalty provisions.

The success of this plan depends, to some extent, on the degree to which Class I use (milk for bottling purposes) and producers' quotas for the market as a whole coincide. If Class I use exceeds the combined quotas earned by producers, the plan may become meaningless. This happened in many markets during World War II. The demand for fluid milk increased so rapidly in many milksheds that all the milk which was produced and more was needed to satisfy Class I needs. Producers were thus paid the top price for all their milk regardless of their quota. Under such circumstances base-quota plans lost much of their effectiveness.

NOTE: Appreciation is due L. F. Friend, Manager, and the staff of the Mid-South Milk Producers Association, Memphis, Tennessee, without whose cooperation and help this study would not have been possible; the several directors and members of the association who contributed ideas and furnished valuable information; and Ruth K. Christie for statistical computations.

In Memphis, as in most other markets, milk producers are paid according to a use-classification scheme. Class I milk is paid for at the top price and other milk, not needed for bottling purposes, is paid for at a lower price representing its value in manufacturing or surplus uses. If, at any particular time, all the milk produced is not needed for bottling purposes, producers are paid a blend price representing the combined returns for all their milk from both fluid and surplus uses.

In most markets, as in Memphis, the use-classification plan *alone* has not been considered a sufficient price incentive to encourage fall production. In some markets, provision is made for varying seasonally the Class I or fluid use price, reducing it in the spring and raising it in the fall.

A second scheme, used in some markets, for the additional stimulation of a seasonally level production pattern is the "take-off and pay-back" or *fall premium plan*. Under this plan a flat deduction is made for each hundredweight of milk delivered in the spring-summer months and retained in a producer-settlement fund. The funds so withheld are paid out to each producer according to his milk deliveries in the subsequent fall-winter months. Since fall-winter deliveries tend to be lower than spring-summer deliveries, the pay-back or premium rates per hundredweight tend to exceed the withholding rate. In some markets this plan is used in conjunction with a use-classification plan *and* a varying seasonal price for Class I milk. The incentive for a producer to strive for more level production arises from the fact that under the plan a producer whose drop in production during the fall-winter months is less than the average for the market is rewarded, while the producer whose drop in production is greater than the average for the market is penalized.

It is hoped that the results of this study will be useful both to officials of the Mid-South Milk Producers Association and others interested in the Memphis milk market, in their continuing effort to reduce the seasonality of milk production in the Memphis milkshed, and to groups in other markets concerned with similar problems.

THE MARKET

Memphis has a population of about one-third of a million. Milk distribution is in the hands of ten firms. Two of these are distinctly larger than the other eight. Producer-distributors have all but disappeared from the market during the past 15 years. Class I or bottled milk sales have averaged about 300,000 pounds per day in recent years. Consumption of milk in the market is fairly stable from one season to another. The index of seasonal variation of Class I milk sales in Memphis for the period from February 1943 to May 1948 shows a range from 96.7 in December to 103.3 in March (table 1).

The Memphis milk ordinance setting forth sanitary requirements is patterned after the standard established by the U. S. Public Health Service. The minimum legal butterfat content of milk is 3.5 percent.

Table 1. - Indexes of seasonal variation of Class I milk sales, Memphis, February 1943 to May 1948

January -----	99.3	July -----	99.6
February -----	101.0	August -----	99.5
March -----	103.3	September -----	102.1
April -----	101.4	October -----	101.8
May -----	99.3	November -----	98.8
June -----	97.5	December -----	96.7

Calculated by the median link relative method from records of the Mid-South Milk Producers Association.

Actually, available information indicates that standard milk retailed by Memphis dealers has at least 3.8 percent butterfat and tends to test as high as 3.9 or 4.0 percent. "Premium" or "high-test" milk with 4.7 to 5.0 percent butterfat also is sold and appears to be rather popular with consumers.

Under the definitions of the ordinance most milk that goes into Class I use is grade "B" raw milk the bacterial count of which must not exceed 200,000 per cc. (cubic centimeter) at any time prior to delivery. Grade "A" pasteurized milk is grade "A" or grade "B" raw milk the bacterial count of which must not exceed 50,000 per cc. between pasteurization and delivery. The ordinance also recognizes certified milk. Grades lower than the common grade "B" raw and grade "A" pasteurized are grades "B" and "C" pasteurized and grades "C" and "D" raw. Grades "C" and "D" milk cannot be sold in Memphis.

Producers in the Memphis milkshed pay an annual permit fee of \$12. The health officer is required regularly to inspect every dairy farm producing milk or cream for consumption within the city of Memphis.

Memphis also has a frozen dessert ordinance. This ordinance requires that grade "A" frozen desserts shall be made in whole or in part from a mix in which the raw milk or milk products used are grade "A" or "B" as defined by the Memphis milk ordinance. This provision is interpreted to require that 50 percent of all milk and cream constituents in ice cream must be grade "A" or "B" raw milk before pasteurization. The gradual increase of this percentage opens up another expanding market to grade "B" raw milk in addition to fluid milk requirements.

THE MILKSHED

The Memphis milkshed is located primarily in the southeastern quadrant of a circle with a radius of 40 miles from the city. Southern Shelby County, Tenn., and De Soto and Tate Counties, Miss., are the principal production areas. West of this area is the famous Mississippi Delta which is devoted primarily to cotton production. The use of land for cotton and truck crop production limits dairying in the area immediately north of the city.

Table 2. - Average number of producers, Mid-South Milk Producers Association, January 1943, to December 1948¹

MONTH	1943	1944	1945	1946	1947	1948
January-----	367	359	362	354	400	456
February-----	369	361	363	360	415	459
March-----	374	364	362	359	423	468
April-----	377	363	365	360	434	469
May-----	373	366	371	370	452	473
June-----	374	366	370	374	454	479
July-----	375	365	370	379	458	475
August-----	372	368	371	379	454	479
September-----	371	366	371	398	456	478
October-----	368	365	365	386	453	478
November-----	369	363	361	392	451	474
December-----	363	362	357	397	451	475
Average-----	371	364	366	376	442	472

¹Total number of daily deliveries per month divided by number of days in the month as calculated by the association.

Dairymen from 80 to 100 miles northeast of Memphis, in the northwestern counties of Tennessee and even across the Kentucky line, recently have started shipping to the Memphis market. The area west and north of the city, across the Mississippi River in Arkansas, is low land with impervious soil which, in general, is not suitable for pasture, although it is used for hay production. A small group of producers, slightly more than a dozen, ship milk from the area between Helena and Marianna, Ark., about 50 miles southwest of Memphis. More than half of the city milk supply is produced in Mississippi.

Slightly under 500 producers were producing milk for fluid consumption in Memphis in the middle of 1948. Most of these are members of the Mid-South Milk Producers Association, the producers' bargaining association. During the war years, the number of producers was considerably lower (table 2). Since 1946, when OPA price ceilings were lifted, there has been a net increase of approximately 100 producers shipping to the market.

The turnover in number of producers shipping to the market is rather high but appears to be declining. If the annual average number of producers shipping to the market is divided by the number of producers who sold their herds during the year,¹ the following figures are obtained, which represent the number of years required for a complete turnover:

1943 - 9.8	1946 - 5.9
1944 - 9.3	1947 - 6.3
1945 - 6.8	1948 - 7.1

¹Data on the number of producers who sold their herds during the year were obtained from the association's records.

Thus, the turnover, relatively rapid from 1945 to 1947, appears to have slowed down in 1948.

A slight seasonal variation in the number of producers shipping to the market can be noted from table 2. The tendency is for the number to be somewhat larger during spring and summer.

An analysis of the average daily milk deliveries per producer indicates that the dairy farms supplying the Memphis market are rather large compared with the average southern dairy farms. Average daily milk deliveries per producer by years from 1943 to 1948 ranged from 600 to 635 pounds (table 3).

Table 3. - Average daily milk deliveries per producer by months, Memphis, January 1943 to June 1948¹

MONTH	1943	1944	1945	1946	1947	1948
	<i>Pounds</i>					
January-----	611	519	524	528	500	561
February-----	612	536	556	548	538	566
March-----	597	572	618	591	572	596
April-----	659	644	714	701	668	692
May-----	685	727	751	730	750	734
June-----	682	702	758	724	779	679
July-----	664	679	733	740	768	686
August-----	612	641	707	712	689	691
September-----	557	618	649	599	645	641
October-----	538	538	567	524	585	569
November-----	526	518	527	478	561	521
December-----	519	508	520	475	565	534
Average-----	605	600	635	612	635	622

¹Average daily deliveries divided by average number of producers. For data, see figure 1 and table 2.

New producers are typically small dairymen who intend to expand their operations as they build up their capital and their credit standing. Capital resources, either in the form of net worth or credit are of particular importance to Memphis dairymen, many of whom buy substantial portions not only of concentrated feeds but also hay. Existing lending institutions in the area tend to specialize in credit for cotton growers. Thus, a situation has developed in which a few feed dealers have assumed the task of providing substantial amounts of credit for feed purchasing.

THE MARKET, 1943-47

As in most fluid milk markets, fluid milk sales increased sharply in Memphis during the war years. Local production, on the other hand, showed no corresponding increase. Except for a small surplus in May and June 1944, Class I sales exceeded milk deliveries from local producers from January 1943 to April 1947 (figure 1). During the fall and winter months of those years, local production fell substantially below market requirements and imports from other areas were necessary. The base-quota plan in effect in the market was retained but in the absence of surplus even during the flush season, the plan for a time lost any real meaning.

The year 1943 marks the transition from moderate to wide seasonal fluctuation. Prior to 1943, the range in the seasonally high and low points of average daily milk deliveries of producers was about 50,000 pounds or less. In some years since 1943, this range has equalled nearly 100,000 pounds or more (figure 1).

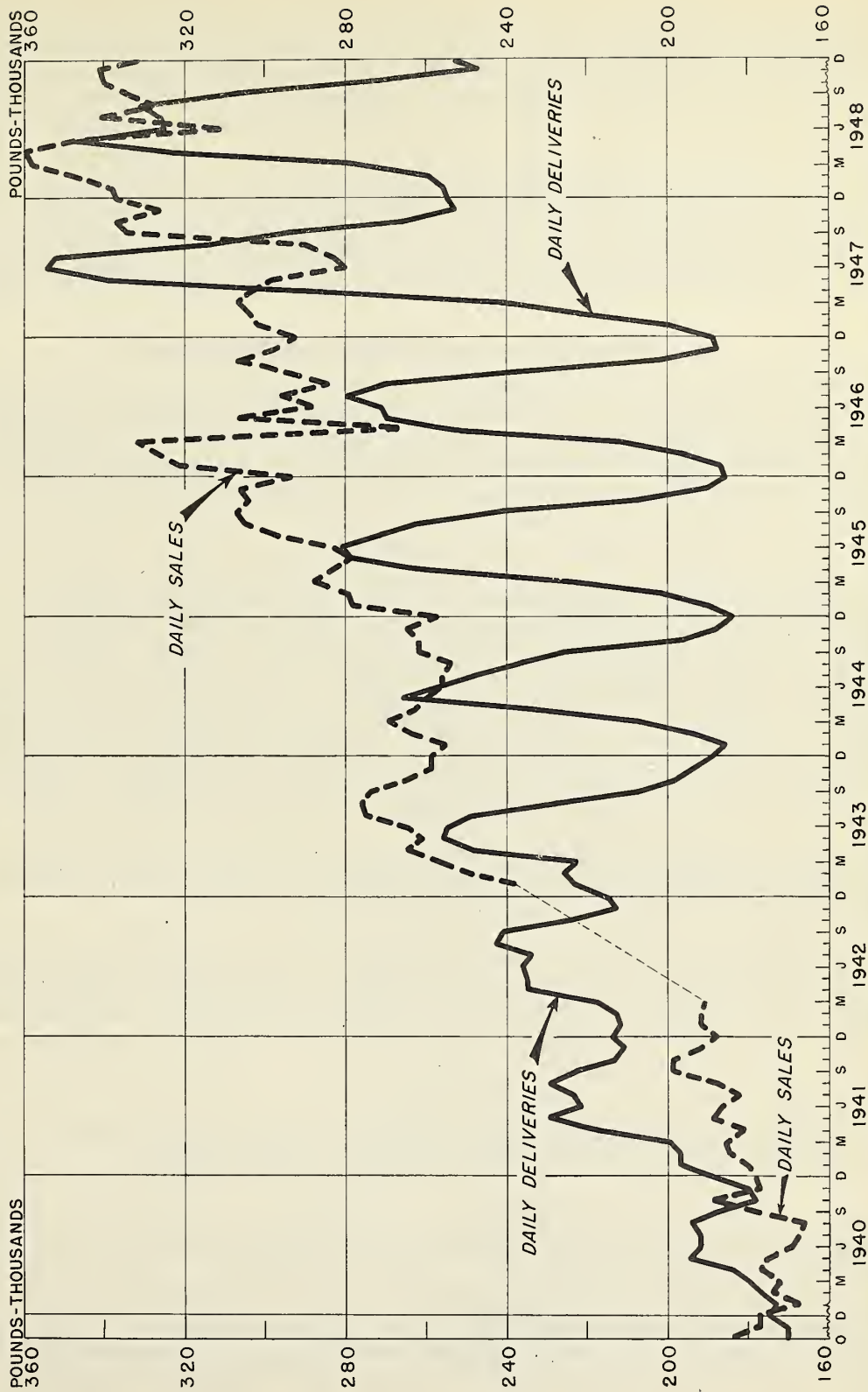
The increase in seasonal variation which occurred is further emphasized by comparing milk deliveries from September through February of each year with those of the preceding and succeeding March through August period (table 4). From 1938-39 to 1942-43, September-February milk

Table 4. - September to February milk deliveries as a percentage of preceding and succeeding March to August deliveries, Memphis, 1938-39 - 1947-48¹

YEAR	SEPTEMBER TO FEBRUARY MILK DELIVERIES AS A PERCENTAGE OF	
	PRECEDING MARCH - AUGUST DELIVERIES	SUCCEEDING MARCH - AUGUST DELIVERIES
1938-39-----	92	92
1939-40-----	96	91
1940-41-----	99	85
1941-42-----	97	92
1942-43-----	96	91
1943-44-----	80	81
1944-45-----	82	75
1945-46-----	77	78
1946-47-----	80	66
1947-48-----	84	82

¹Calculated from association data. These percentages were computed as ratios of the sums of the 6 daily average milk deliveries by months. Thus, each month received the same weight regardless of length.

FIGURE I
 AVERAGE DAILY MILK DELIVERIES OF PRODUCERS AND AVERAGE DAILY
 CLASS I SALES OF MILK, MEMPHIS, OCT., 1939 TO DEC., 1948



SOURCE: CLASS I SALES ESTIMATES OCTOBER, 1939 TO MARCH, 1942 FROM REPORTS OF MEMPHIS DAIRY COUNCIL AS SHOWN BY BAIN AND FOREST IN EXHIBIT 3, P. 40, DOCKET NO. AO-16B, HEARING CLERK, OFFICE OF THE SOLICITOR, U.S.D.A. ALL OTHER DATA BASED ON ASSOCIATION RECORDS

deliveries ranged between 92 and 99 percent of those during the preceding March-August period. In the following 5 years the range was generally in the low 80's, and in 1 year dropped to 77. A comparison of milk deliveries from September to February with the succeeding March to August period shows a similar difference between earlier and later years.

This increase in seasonality of production, plus the general shortage of local production in relation to the needs of the Memphis market during much of the year, led to the consideration of additional measures to make the base-quota plan in the Memphis milkshed more effective.

MID-SOUTH MILK PRODUCERS ASSOCIATION

The base-quota and penalty plan in the Memphis milkshed has been sponsored and is administered by the Mid-South Milk Producers Association. A brief review of the history and operations of the association is provided as a setting for the analysis of the plan which follows.

ORIGIN

The Mid-South Milk Producers Association was organized in 1941. The new association had to overcome not only the hostility of dealers on the market but the antagonism of many producers as well. Producer antagonism was the result of previous disappointing experiences with cooperatives. The first producer-cooperative in the milkshed dates back to 1924. At that time a cooperative bargaining association known as the Shelby County Milk Producers Association was organized. This association functioned as a bargaining agency for about 5 years and then went into the milk distributing business.² Its operations were none too successful in the depression years that followed. By 1934, many producers had withdrawn from the association and shifted their patronage to proprietary distributors in the market.

The plant of the Shelby County Producers Association was finally sold by its principal creditor in 1935 and the association disbanded.³ Subsequently, efforts to organize were made by producers patronizing each of the two larger dealers in the market. Neither organization ever seemed to have functioned effectively as a bargaining agency. Until 1942, when the Mid-South Milk Producers Association started functioning, the market was characterized by a complete lack of uniformity in dealers' buying practices and other treatment of producers.

²Waldauer, A. D., The Story of a Typical, Small Milk Cooperative. The Cooperative Marketing Journal 3(4): 101-105. July 1929. Written at the height of the success of the association, this account is highly optimistic.

³These and the following statements are based on an unpublished report of a visit to Mid-South Milk Producers Association, Memphis, Tenn., by L. F. Herrmann, dated May 13, 1942, in the files of the Dairy Section, Cooperative Research and Service Division, Farm Credit Admin., U. S. Dept. Agr., and on an unpublished report, Economic Statement Concerning the Memphis, Tenn., Milk Market and The Proposed Marketing Agreement and Order for That Market by B. W. Bain and H. L. Forest, Dairy and Poultry Branch, AMA, U. S. Dept. Agr., June 1942, filed with the Hearing Clerk, Office of the Solicitor, U. S. Dept. Agr., as Exhibit No. 3 to Docket No. AO-168, Proposed Marketing Agreement and Proposed Order Regulating the Handling of Milk in the Memphis, Tenn., Marketing Area.

The Mid-South Milk Producers Association was chartered under the Cooperative Marketing Law of Tennessee on December 18, 1941. Following an intensive membership drive, the association attempted to function as a bargaining agent for its members in the spring of 1942.

The milk distributors in the market refused, however, to sign contracts with the association or to recognize it as the bargaining agent for its members. Accordingly, the association appealed to the Secretary of Agriculture to issue a marketing agreement and order for the market under the provisions of the Agricultural Marketing Agreement Act of 1937.⁴

A hearing was called to consider the feasibility of an order. The association was able to present evidence showing marked irregularities in the treatment accorded producers in the market.⁵ Payments to individual producers differed with respect to base and surplus prices and with respect to base and surplus butterfat differentials during the same month. In the case of one plant, different surplus prices and different surplus butterfat differentials were simultaneously paid to various patrons. The division of the milk supply into Class I and surplus was accomplished arbitrarily and thus probably did not reflect actual use. Typically, a producer had an "average" or allotted daily quantity of his supply for which he received the Class I price. Originally, the "averages" were established by mutual agreement between each producer and his dealer. However, for several years the averages had a cash value ranging from \$1 to \$3 per pound when bought by a producer either from a dealer or from a fellow producer. A vested interest had thus been created in the quotas assigned to producers in the market, a danger which is always present in any "closed" base plan.

Evidence showed that producers sometimes received additional amounts of "average" or entire averages gratis to encourage them to increase production or to transfer patronage. A variation of this "average" plan was the percentage plan under which the Class I price was paid for a specified fixed percentage of a producer's deliveries, usually 80 or 90 percent, and the remainder was paid for at the surplus price. Some dealers paid producers the Class I price for all their milk.

⁴The Agricultural Marketing Agreement Act of 1937 authorizes the Secretary of Agriculture to enter into marketing agreements with and to issue orders to the handlers of certain agricultural commodities in interstate commerce. The Act specifies the things which may be done under marketing agreements and orders. An "agreement" is a voluntary contract between the Secretary of Agriculture and the handlers of a commodity. If the handlers refuse to enter into such an agreement - and such refusal is the usual occurrence in the field of milk marketing - the Secretary can issue an order without agreement. In such an order, milk is classified by use-classes, minimum prices which all handlers must pay for each class are set, and producers' returns are pooled so that no producer gains or suffers from the specific uses made of his milk. A market so regulated must have some interstate commerce aspects; the Secretary must determine that the refusal of the handlers to enter into an agreement prevents the establishment and maintenance of orderly marketing conditions - which is the declared policy of the Act; and at least two-thirds of the producers by number or by volume of production must approve the order. The proposed agreement and order, as submitted by the association, is published in 7 Federal Register (105): 3997-4002. May 29, 1942.

⁵Hearing Clerk, Office of the Solicitor, U. S. Dept. Agr., Docket No. A0-168, June 18, 1942, pp. 211-247.

After completing the appropriate administrative steps, including approval of the order by over 77 percent of the producers, Federal Order No. 64 was issued effective October 4, 1942.⁶ The salient features of this order were:

(1) Milk was classified according to its use. Class I milk was all bottled products and all other milk was Class II milk. Class II milk was defined as all milk specifically accounted for (a) as used to produce a milk product other than those specified in Class I milk and (b) as actual plant shrinkage not to exceed 2 percent of the total quantity of milk of producers including the handlers own production.

(2) Handlers were required to make the customary reports to the market administrator concerning receipts and use of milk.

(3) The market administrator was empowered to establish and maintain a producer-settlement fund in order to effect a market-wide milk pool. Thus, no producer would suffer any discrimination because he patronized any one dealer. Each producer shared in Class I sales in proportion to market-wide rather than individual dealer Class I sales.

(4) Provisions were made for a base rating plan. The average daily amount of milk delivered during September through November, which was used as Class I milk in the pool, was to form each producer's base for the following calendar year.

(5) Dealers were to pay 4 cents per hundredweight to the market administrator to defray the cost of administering the order. Dealers also were to deduct 5 cents per hundredweight from their payments to producers and to pay these deductions to the administrator to finance the cost of verifying weights, sampling and testing milk, and providing producers with market information.

The dealers refused to comply with the order and a suit was instituted by the Government. Before the merits of the case could be decided, the dealers signed contracts with the association. The association petitioned the Secretary of Agriculture to suspend the order and this was done on January 20, 1943.⁷ The pending case in court was dismissed and the order was terminated later in 1943.⁸

The Federal milk marketing order for Memphis even though never complied with by all parties was of strategic importance in introducing orderly and equitable conditions into the Memphis milk market. Clearly the Federal order was an important factor in aiding the association to obtain the recognition it sought. This is not to imply that the recognition could not have come by other means. Without the Federal order, however, it would have come only after a prolonged struggle, the aftermath of which might have left a bitterness which would have impaired

⁶7 Fed. Reg. 6086 f. and 7794 ff. and 7 Code of Fed. Reg. 964.

⁷8 Fed. Reg. 998.

⁸8 Fed. Reg. 8623.

indefinitely a working relationship between producers and dealers in the market. Neither is it meant to imply that the present working relationship between the producers' association and dealers in the market is something that came into being automatically as a result of the Federal order episode. Present arrangements whereby milk marketing problems are handled without the assistance of any public regulatory body, are a tribute to the foresight, moderation, and flexibility, which the directors and manager have displayed in guiding their association.

MEMBERSHIP CONTRACT

The association signs marketing contracts with all its members. Under the terms of this contract, the producer appoints the association his agent to market all milk and other dairy products which he produces for sale. The contract, originally valid for 2 years, continues automatically for 1-year periods unless written notice is given by either party between 15 to 30 days before the expiration of the contract period. A producer's notice of contract termination must be delivered in person. Tenants, relatives, or friends taking over a dairy business are bound by the contract except in the case of a member's death or a bona fide sale of the farm. The association for its part agrees to market the member's products at the best prices obtainable in its judgment and to pay the producer his proportionate share of the total receipts less necessary and authorized deductions. It is stipulated that payments are to be made on or before the 25th day of the month following delivery of the products. The contract further provides that all producers must be treated equitably.

The association, under the terms of the contract, is authorized to make deductions from the proceeds of its sales to defray expenses and to create reserves in accordance with its bylaws. All deductions must be accounted for at the close of the fiscal year.

Paragraph 4 of the contract stipulates "That the Association may make arrangements for the sale and payment for the milk or other dairy products on different bases but the Producer shall be paid at the same rate as other producers signing similar contracts whose dairy products have been delivered to the Association under similar conditions and are of similar quality subject to such equitable differentials as the Association or its Board of Directors from time to time may establish." This paragraph grants the board of directors considerable discretion in determining the marketing and payment plan.

The association is authorized to deal with any of the products for which it is marketing agent *as though they were* the property of the association. This provision would seem to indicate that the association legally never acquires and owns the milk which it markets for its patrons, although the association is authorized to exercise all the attributes of ownership.

Paragraph 7 of the contract reads: "That the producer will endeavor to follow the instructions of the Association as to the proportionate quantities of milk or other dairy products, produced during the several months of the year in order that an adequate supply for consumers may be available at all seasons, and that he will observe the laws, rules, and regulations of State and local governments and the Association with regard to the quality and condition of the milk delivered hereunder." This paragraph, together with paragraph 4 quoted above, lays the groundwork for the base-quota plan, the very essence of which is to make the producers deliver an adequate supply of milk at all seasons.

Under the contract, the producer agrees to pay certain liquidated damages to the association in case he breaks the contract; he furthermore agrees that the association shall be entitled to an injunction to prevent breach of contract.

The contract further provides that the producer is not obligated to sell any specified amount of dairy products through the association, but he must sell all that he markets through the association except by the written consent of the association. This stipulation is, in one respect, superseded by the new base-quota plan under which a producer is obliged either to deliver his quota during the low-production season or to pay penalties for the undelivered part of his quota to the extent to which the market demands it.

ASSOCIATION-DEALER CONTRACTS

The association began its full operations on January 20, 1943, the day Order No. 64 was suspended. On that day the milk supply contracts between the association and each dealer in the market went into effect. With some modification these contracts still continue in force.

Under the terms of each contract, the association agrees to deliver to the dealer all the Memphis-approved milk needed for his normal requirements in the city of Memphis. If the association's members fail to deliver sufficient milk for the dealer's normal requirements or even for above-normal requirements, the association pledges itself to make an effort to locate additional, approved milk supplies, from sources other than its membership, and to deliver them to the dealer who agrees to accept them.

This contract laid the groundwork for the present base-quota plan by delegating the responsibility for the Memphis milk supply to the association. Initially, however, the association did not assume any responsibility for importing supplies, if local production failed to meet all market needs. Moreover, in order to avoid any stipulation in the contract or any action that could be interpreted as restraint of trade the contract specified that: "In the event the Association is unable promptly to procure and deliver such normal requirements or such additional requirements to the Dealer, the Dealer, upon proper notice to the Association, shall have the right to obtain such needed milk or its products from other sources as the Dealer shall see fit."

Uniform treatment of all producers is safeguarded by the following provision: "It is further understood and agreed that neither the members of the Association nor the producers of milk who are not members shall in any wise be discriminated against, it being understood that such non-members shall continue to sell their milk to the Dealer so long as they desire and so long as the Dealer desires to purchase such milk and that no arrangement between the Dealer and such non-member producers shall be affected whereby the Association's membership shall suffer by discrimination."

The apparent inconsistency of wording in referring to "all of the Memphis approved milk required by the Dealer for his normal requirements" on the one hand, and non-member producers on the other, is explained by the fact that the contract permitted a dealer to continue existing relations with non-member producers.

The association further agreed, under its contract with dealers, to direct the daily delivery of milk to the plant as early as possible in the day and in as few truckloads as expedient.

The dealer, under the terms of the contract, agreed to pay the association a service charge of 5 cents per hundredweight (since February 1948, 7 cents) on all approved milk and its products received by the dealer direct from milk producers and to pay this service charge on or before the 15th of the month following the month of delivery. This payment is "in consideration for the effort, service, and expense that the Association incurs in its marketing service to the Dealer which includes, among other things, the operation of a producer settlement fund, usage audits, check testing and check weighing of milk and its products received at the Dealer's plant, and its efforts to maintain an adequate supply of the proper quality milk and its product regularly needed by the Dealer." This same service charge is also referred to in the by-laws and the producer contract of the association. Actually the dealer makes payment for two different items, (1) the milk itself and (2) the services rendered by the association. The bylaws and the producer contract expressly authorize the association to receive the service charge, to deduct it from the gross payment of the dealers, and to use it for financing the activities of the association.

The dealer agrees to keep records showing all receipts of milk and its products, their source, quality, quantity, and use, and to render summaries of these records to the association. He also agrees to permit the association representatives to take product inventories, to audit records covering all sales and processing activities, and to sample the milk and milk products making a portion of the sample available to the dealer. Association representatives must neither copy nor divulge the names or addresses of the dealer's customers, prices charged to or paid by such consumers, or the destination of shipments. The association and the dealer agree to furnish each other evidence of their ability to pay, security, and guarantee of payment whenever demanded - the dealer for his purchases, the association for its obligations to the dealer in connection with the operation of the producer settlement fund.

The dealer contract contains a provision for arbitrating disputes and for paying the cost of such arbitration. The contract is self-renewing unless written notice is given on or before August 2 of each year to take effect October 1. If one party requests or invokes any Government regulation or if any Government authority should impose terms other than through mutual agreement between the contracting parties, the contract may be terminated at the option of the non-assenting party.⁹

Attached to and made part of the milk supply contract is a schedule providing for the classification of milk according to the same plan that was incorporated into Federal Order No. 64 -- Class I consists of bottled milk, cream, and their bottled products; Class II consists of milk products other than those specified in Class I and actual plant shrinkage not exceeding 2 percent.

The interest of local producers in having their approved milk used as Class I, before imported milk is so used, is safeguarded by an appropriate provision.

A fixed Class I price was inserted into the schedule of the original contract. This price has been changed from time to time by bargaining. Unless a change in the existing price is sought, the Class I price of the preceding month continues to the next month. More recently the association has simply announced the Class I price and the dealers have paid it. The Class II price is the formula price that was incorporated in Federal Order No. 64. It is calculated as follows: 120 percent of the 92-score Chicago wholesale butter price times 4 (for 4 percent milk) plus $3\frac{1}{2}$ cents for each full one-half cent that the price of dry skim milk for human consumption is above $5\frac{1}{2}$ cents per pound f.o.b. manufacturing plant in the Chicago area or above $7\frac{1}{2}$ cents per pound delivered at Chicago if the former price quotation is not available.

The contract provides that dealers are to pay the approximate value of the milk received during the first 15 days of the month on or before the last day of the month and are to complete settlement for the month on or before the 15th of the following month.

⁹Arbitration by the Secretary of Agriculture under the terms of the association-dealer contract, according to the provisions of the Agricultural Marketing Agreement Act of 1937 (7USC 671), and according to the Procedure Governing Meetings to Arbitrate Disputes Relating to Sales of Milk or Its Products (7 C.F.R. 900.100-900.220) would, of course, be no ground for contract termination, since such arbitration would take place with the consent of all parties.

POSITION OF NON-MEMBERS

There are three groups of non-member producers in the market. The first group consists of a few producers in the Memphis area proper who are only formally non-members but who participate in all membership benefits. The association samples, weighs, and tests their milk and, of course, receives the same payment for these services as from members. They participate in the producer settlement fund and in the base-quota plan. Their status is one of complete equality with members except that they do not pay the \$2 membership fee and so have no vote in the association.

The second group consists of a number of producers in northwestern Tennessee whose milk goes through Memphis plants for processing but is supposedly consumed outside the city. These producers are holders of Memphis Health Department permits. This group greatly expanded in 1947 and 1948 and accounts for the increasing difference between Memphis Health Department permit holders and patrons of the association.

The third group are the producer-distributors whose number has dwindled from 215 in January 1929 to only 2 in July 1948. Their average daily sales have gradually shrunk from about 20,000 pounds in 1941 to less than 1,000 pounds in mid-1948. Producer-distributors sales are excluded from all statistics shown in this publication, since the association is in no way concerned with their milk. This exclusion, however, tends to overemphasize the upward trend of milk supply and consumption in Memphis based upon the association records. It must be borne in mind that part of the upward trend has simply been the absorption by the association of the waning producer-distributor business.

FINANCES

The operations of the association are financed through a service charge of 7 cents per hundredweight (5 cents before February 1948), which all dealers pay the association on all milk received.

The base-quota plan is operated through the producer settlement fund. Reserves accumulated in this fund amounted to slightly less than \$68,000 on July 31, 1948. These reserves accumulated largely through the differential between receipts from the dealers according to use classification and payments to producers according to their quota and over-quota deliveries. A certain reserve is needed for adjustments after the dealers' milk use records have been audited.

As the association grew in strength and experience it became desirable to accumulate reserves in the producer settlement fund by the revolving method. At the membership meeting held in March 1948 it was decided to set up a 5-year reserve revolving fund by deducting 2 cents per hundredweight from each producer's monthly milk check and crediting the amount so withheld to the producer's equity account in the association. With total annual deliveries of one million hundredweight the revolving fund will grow by \$20,000 each year and become a \$100,000 fund before the amounts withheld in the first year will be retired in the sixth year under the 5-year revolving plan. A producer who ships 500 pounds daily would have an investment of \$182.70 in the revolving fund after five years.

THE MEMPHIS BASE-QUOTA PLAN¹⁰

Milk dealers and producers in the Memphis, Tenn., market had informal arrangements in the nature of base-quota plans prior to 1942 and a formal base-quota plan was adopted in the Federal Milk Marketing Order for Memphis in 1942. During the war, as in many other markets, expanded fluid milk consumption rendered the base-quota plan relatively ineffective. The plan was retained, however, in spite of its temporary ineffectiveness.

UNDERLYING PRINCIPLES

The argument in favor of any base-quota plan is about as follows: If milk is simply pooled according to general use, fall and winter prices tend to be high, because most milk will be used for fluid consumption during that season. Spring-summer prices tend to be lower because they are averages of the high prices paid for milk for fluid use and of the lower prices for surplus milk which is produced in considerable quantity during that season. Dairymen who produce uniformly throughout the year should not suffer a price cut during the spring and summer because their unevenly producing neighbors deliver surplus milk. Thus, the first argument in favor of a base-quota plan is that it is equitable. Moreover, the even producer, it is argued, needs a higher income than the uneven producer, because he has to spend more money and effort to maintain an even flow of milk throughout the year. If the pricing plan in the market is such that the even producer is rewarded for his effort, an incentive is provided for achieving and maintaining an even production pattern.

When combined producer quotas for a market drop substantially under Class I sales, however, and practically all the milk produced during the flush season can be marketed as Class I milk, a base-quota plan loses

¹⁰The agreement between the Mid-South Milk Producers Association and individual producers concerning the plan refers to it as The Bottled Milk Quota Plan.

its effectiveness. There is no longer any reward for producing evenly. A producer who delivers twice as much milk in May as in November can still be paid the top price for all his milk. This is what happened in Memphis during the war. The first effect of this development was to accentuate the problem of seasonal shortages. Looking ahead, the management of the producers' association was fearful that eventually it might lead also to a situation in which the market was faced with a serious problem of seasonal surpluses during the spring of the year while at the same time being dependent upon imports from other producing areas during other seasons.

Officials of the association, therefore, cast about for a means of adapting the base-quota plan to market conditions under which fall and winter shortages posed at least as serious a problem as spring and summer surpluses.

Beginning in 1945, the association assumed responsibility for importing milk into the market when local production was insufficient to meet all the Class I needs of the market. Although the cost of imported milk f.o.b. Memphis was generally higher than the prices received by local producers, the association incurred no losses on the operation, because dealers were billed for the actual cost of the milk imported. It was apparent that the need for imports was aggravated by the failure of producers to deliver up to their previously established quotas. The idea was hit upon, therefore, of making producers individually responsible for their failure to deliver their quotas during the fall and winter months to the extent that such underquota deliveries caused shortages in the market and made imports necessary. It was proposed to do this by the association charging dealers the same price for imported milk as that locally produced and prorating the losses on imported milk among those producers who failed to deliver their full quotas thus making imports necessary. In the case that the Class I needs of the market would exceed milk deliveries and the sum of all quotas, it was proposed to increase quotas of all producers on a prorata basis so that all Class I market needs would be fully covered by quota assignments.

A number of reasons were advanced for the soundness of this idea. The most important justification was the incentive which it would give dairymen to produce evenly. If uneven production would mean not only lower prices for the spring-summer surplus but also penalties for failure to deliver up to a predetermined standard during the fall and winter, producers would be made more conscious of the impelling need to level their milk production. It was argued that more level production would increase not only producers' gross income but also their net earnings.

It was also argued by those who advanced the plan that, if the association guaranteed supplies to the market and financial responsibility for furnishing these supplies, producers would have additional income in the form of higher prices which otherwise they would not receive. The reasoning was that dealers would reduce their margin if relieved of the need to pay the higher cost of fluid milk imports.

A membership meeting was called to consider the adoption of quota penalty provisions in August 1945. The plan was unanimously approved. It did not actually go into effect, however, until May 1947.

HOW THE PLAN WORKS

The Memphis base-quota plan consists of (1) general base-quota provisions and (2) penalty provisions for underquota deliveries.

The quota year begins April 1. September through February is the *quota earning period* of each year, although the quota year does not end until March 31. When production exceeds bottled milk sales, the quantity of milk which a producer may market at the top, or Class I, price is based upon his production during the previous quota earning period. A producer may be subject to penalties if his average daily milk deliveries do not equal his quota and if imports are necessary.

The association furnishes distributors in the Memphis market sufficient supplies to satisfy Class I needs at all times. This means that if local production is insufficient to satisfy all the Class I needs of the market, the association imports milk. Generally the imported milk has cost the association more f.o.b. Memphis than the Class I price paid local producers. The association charges distributors the same price for imported milk, however, as for milk locally produced. Losses thus incurred on milk which has to be imported are first prorated among producers who deliver less milk than their predetermined quotas. The maximum penalty, for which an individual producer may be liable, tends to be the net loss per hundredweight which the association incurs on imported milk times the quantity by which the producer's actual milk deliveries fall short of his quota. However, if imports exceed undelivered quotas, an underquota producer may be assessed an additional pro rata share of such excess.

The quotas used during the first period in which the plan operated, May 1, 1947, through March 31, 1948, were chosen by the producers. Each member of the association simply declared the quantity of milk which he proposed to furnish the association. Any producer who did not declare a quota was given his previous quota based upon his milk deliveries from September to November 1942. This declared quota was used as the basis for paying the producer during the flush season and for assessing penalties against him during the fall and winter months when the association had to import milk.

After the first year's operation, the plan provides that quotas shall be based upon a producer's average daily marketings from September through February of each year to which may be added his pro rata share of any milk imports which may have been necessary. However, if Class I milk sales are less than total deliveries, but in excess of the old quotas, only the old quota deliveries plus a prorated portion of overquota deliveries are allowed as quota credits.

Other important features of the plan are as follows:

(1) If Class I sales for the market exceed the combined quotas of all producers, an individual producer receives the Class I price only for

the amount of his quota. Overquota deliveries are paid for at a blend price determined by overquota Class I sales and surplus sales in the market.

(2) Provision is made for expanding producer quotas to the point where the combined total of all quotas approximates Class I sales during the low production season. Any deficiency between Class I sales and the sum of all producers' quotas is first assigned to producers whose milk deliveries are in excess of their quotas in the amount of these excess deliveries. If the combined quotas still do not equal Class I needs of the market, the excess of Class I sales over the sum of the quotas thus adjusted may be prorated among all producers, on the basis of their quotas. However, in the language of the Bottled Milk Quota Plan, "the Association may, upon notice, again offer each producer the privilege of refusing any upward adjustment of the new quota. Upon refusal by the producer the Association may distribute the adjustment among producers willing to accept it." If there were not enough producers willing to accept additional quota, the board of directors would supposedly have to apportion the necessary amount of additional quota among all producers without giving them the privilege of rejecting it.

(3) Quotas and quota credits are transferable among producers at the beginning of each month. A quota transfer is simply a transfer from one producer to another of all or part of his quota. The producer giving up quota is relieved of the obligation of delivering the amount of milk involved, and the person receiving the quota has his obligation correspondingly increased. A transfer of quotas does not affect the calculation of the base or quota for the following year of either producer involved in the transaction. Both continue to have their quotas calculated on the basis of their actual daily milk deliveries from September through February.

When quota credits are transferred, however, the quota for the following year which the producer relinquishing credits would otherwise have (based upon his actual daily milk deliveries) is reduced by the amount of credits involved in the transfer. The quota for the next year of the producer receiving the credits is increased by a corresponding amount over what it would otherwise be calculated on the basis of his actual daily milk deliveries during the quota forming period.

An illustration will make the distinction between *quotas* and *quota credits* clear. Assume that Farmer Smith with a 500 pound quota delivers just his daily quota throughout the fall. As of January 1 he transfers 200 pounds of quota but no quota credits to Farmer Brown for the remainder of the current quota year until March 31. Farmer Brown will have

his quota increased by 200 pounds and Farmer Smith will have his quota decreased by a like amount. If Farmer Smith continues to deliver 500 pounds per day throughout the remainder of the current quota forming period, until the end of February, his quota for the next quota year beginning April 1 would be calculated on the basis of milk deliveries of 500 pounds per day (not 300 pounds) from January 1 to the end of February plus, of course, credits he had earned from September through December. Farmer Brown would likewise have his quota computed on the basis of his actual daily milk deliveries without regard to the quota transfer.

Farmer Smith also could have transferred quota credits when he transferred 200 pounds of quota for January and February. Suppose this had been done and that Farmer Smith had continued to deliver 500 pounds of milk a day. In this instance, he would have received credit for deliveries of only 300 pounds of milk per day for the remainder of the quota forming period in calculating his quota for the new quota year beginning April 1. Farmer Brown, on the other hand, to whom the 200 pounds of quota plus quota credits were transferred would have had the 200 pounds of daily quota credits for the remainder of the quota forming period, January and February, *added* to his credits based on actual milk deliveries in calculating his quota for the following year. In other words, had Farmer Brown actually delivered 800 pounds of milk a day during January and February he would nevertheless have been credited with deliveries of 1,000 pounds a day during the period in calculating his quota for the next year. A producer also may transfer quota credits without transferring any part of his quota.

The association does not keep a record of any consideration that is given in exchange for transfer of either quota or quota credits. However, officials of the association know of instances in which either quota or quota credits have been transferred among neighbors without any consideration and of other instances in which quotas were purchased at prices ranging from \$1.50 to \$3.00 per pound of quota. The reverse situation is conceivable, however, in which a producer would be so anxious to get rid of part of his quota that he would be willing to pay another producer for accepting it. Such payment, of course, would not exceed the estimated maximum penalty which would have to be paid for constant nondelivery of the amount of quota in question.

What does the buyer of quota acquire? If he buys during the spring and summer months, he acquires the privilege of receiving Class I price for the quota purchased rather than a lower blend price or perhaps only a Class II price. Furthermore, he assumes the obligation to supply the market with whatever proportion of his quota is required during the low-production season that follows. If he acquires quota during the low-production season he simply assumes the supply obligation.

What does the buyer of quota credits acquire? Quota credits are transferred during the quota forming period only, of course. They mean nothing for the current September to March season. Whether and how much

they will mean in the new quota year beginning April 1 depends on the existence and extent of surplus deliveries, and on the differential between Class I and Class II or blend prices.

A quota adjustment committee of the board of directors of the association has been set up to consider special requests for quota adjustments; however, its services have so far not been sought.

(4) Provision is made for a proportional reduction in quota if Class I sales should be smaller than milk quota deliveries from all producers. Should this occur, the penalty provision would, of course, be inoperative. This emphasizes the fact that the application of penalty provisions, such as have been added to the Memphis base-quota plan, would be limited to markets which have to depend upon imports from outside the milkshed for a part of the year.

OPERATIONS UNDER THE PLAN

PRODUCERS' QUOTAS

The old producer quotas for the Memphis milkshed, before the present quota plan went into effect on May 1, 1947, totaled 292,899 pounds per day. These quotas were supposedly based upon September to November 1942 milk deliveries but the total included amounts in addition to the original base. The self-chosen quotas of producers with which the new plan began operations totaled 312,093 pounds. New quotas were selected in May 1947 at the height of the seasonal peak of milk production. This may have made producers overly optimistic. In any event, subsequent September to March milk deliveries fell considerably below the combined quotas for the milkshed (table 6).

Quotas for the year beginning April 1, 1948, determined by September through February milk deliveries plus imports, amounted to 278,016 pounds. Of this, 262,657 pounds represented average daily milk deliveries of producers and 15,359 pounds represented average daily milk imports as charged to underquota producers. In addition new quotas totaling 3,067 pounds were granted making the total quotas for the second year 281,083 pounds.

Fluid imports during the first year of operation under the new plan never comprised more than 6.7 percent of the quota. They averaged 4.3 percent of the full quota for the 7-month import period, September 1947 through March 1948 (table 7).

More than one-half of all dairymen supplying the Memphis market earned daily delivery quotas ranging from 300 to 700 pounds during the first quota earning period under the new plan.

Almost one-third of all producers' quotas fell in the 301 to 500 pound brackets. Only 14 percent of all quotas amounted to 300 pounds or less, 46 percent were between 501 and 1,000; 9 percent exceeded 1,000 pounds (table 5).

Table 5. - Number and percent of producers, by daily quotas, Memphis, April 1, 1948

QUOTAS	PRODUCERS	
	Number	Percent
<i>Pounds</i>		
1 - 100-----	6	1
101 - 200-----	21	5
201 - 300-----	36	8
301 - 400-----	74	16
401 - 500-----	70	15
501 - 600-----	55	12
601 - 700-----	62	13
701 - 800-----	38	8
801 - 900-----	35	7
901 - 1000-----	30	6
1001 - 1100-----	19	4
1101 - 1200-----	6	1
1201 - 1300-----	10	2
1301 - 1400-----	2	2
1401 - 1500-----	1	
1501 - 1600-----	2	
1601 - 1700-----	2	
-----	1	
3101 - 3200-----	1	
All quotas-----	470	100

Tabulated from records of Mid-South Milk Producers Association.

COST OF IMPORTS

The total net costs to the association for imported milk from September 1947 through March 1948, was \$53,653 (table 9). These costs were 1.5 percent of producers' receipts which amounted to \$3,464,767 before penalty deductions for the same period (table 9). The highest net import costs or penalties of any month on record were incurred in November 1947; they amounted to 2.2 percent of producers' receipts during that month which was also the maximum percentage. Total net import costs for the calendar year 1948, which comprises parts of two quota years, were 0.7 percent of producers' receipts during the calendar year. Penalties during the first four months of the 1948-49 import season tended to be lower than during the same period a year earlier. The association made savings by importing skim milk rather than whole milk, since it was primarily milk-solids-non-fat that were short in supply.

These savings were made even though the combined volume of imports in November and December 1948 was more than twice that of November and December 1947. The September and October 1948 import record marked an improvement over 1947, but a comparison of the combined four-month, September to December, import period shows 1948 imports substantially in excess of 1947 imports (tables 7 and 8).

Table 6. - Milk deliveries of local producers, Class I and Class II sales of milk supplied by association, amounts of undelivered quota milk, overquota deliveries during shortage seasons, and fluid milk imports by months, Memphis, May 1947 - December 1948.

YEAR AND MONTH	DELIVERIES	CLASS I SALES ¹	CLASS II SALES ²	UNDELIVERED QUOTA MILK ³	SHORTAGE SEASON OVERQUOTA DELIVERIES ⁴	FLUID IMPORTS
<i>Pounds</i>						
1947 May-----	10,501,536	8,822,913	1,678,623	-	-	-
June-----	10,614,954	8,313,054	2,301,900	-	-	-
July-----	10,910,808	8,478,940	2,431,868	-	-	-
Aug.-----	9,701,809	8,695,945	1,005,864	-	-	-
Sept.-----	8,817,653	8,843,238	201,947	986,964	441,827	227,081
Oct.-----	8,210,697	8,681,292	80,705	1,623,618	159,432	551,300
Nov.-----	7,590,732	8,096,145	125,148	1,911,741	139,683	630,561
Dec.-----	7,897,090	8,102,330	178,246	1,875,852	98,059	383,486
1948 Jan.-----	7,929,446	8,134,183	173,229	1,933,628	188,191	377,966
Feb.-----	7,534,332	8,705,256	170,278	1,671,480	155,115	341,202
Mar.-----	8,644,792	8,862,392	107,777	1,477,281	447,190	325,377
Apr.-----	9,731,154	9,233,993	497,161	-	-	(5)
May-----	10,769,050	9,298,710	1,470,340	-	-	-
June-----	9,752,235	8,631,416	1,120,819	-	-	-
July-----	10,100,728	8,829,939	1,270,789	-	-	-
Aug.-----	10,262,904	8,717,990	1,544,914	-	-	-
Sept.-----	9,199,032	8,822,173	395,170	-	-	618,311
Oct.-----	8,428,298	8,712,939	244,589	903,680	618,405	529,230
Nov.-----	7,401,864	8,254,398	252,042	1,464,587	433,961	1,104,576
Dec.-----	7,864,372	8,625,217	201,936	1,366,356	517,155	962,781

¹Total Class I sales in the market exceeded the amounts shown here by sales of bottled dairy products reconstituted from dried and evaporated milk (fig. 1).

²Class II sales during the low production season consisted primarily of shrinkage, also of some butterfat surpluses and of small amounts of milk surplus.

³These figures were calculated from imports as charged to underquota producers (see bottom of tables 7 and 8) and from the percentages which these charges were of total undelivered quota milk (see page 25). The amounts shown in this column were partially offset by overquota milk deliveries of other producers. See footnote 4.

⁴Estimates of producers' milk deliveries in excess of their quotas partially offsetting underquota shown in preceding column. Estimates based on assumption that 1947-48 daily quota was 312,093 pounds and 1948-49 quota 281,083 pounds throughout the quota year. Minor quota changes during the course of the quota year were thus disregarded.

⁵Two tank trucks of milk were imported on April 1, 1948, and paid for out of the settlement fund.

⁶Paid out of settlement fund reserves.

From association records.

Table 7. - Fluid milk imports to Memphis under the new plan, September 1947 to March 1948

	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	TOTAL FOR SEPT.-MAR.
Milk imported, pounds-----	227,081	551,300	630,561	383,486	377,966	341,202	325,377	2,836,973
Percent of quota-----	2.4	5.7	6.7	4.0	3.9	3.8	3.4	4.3
Butterfat imported, pounds-----	6,654	19,505	23,324	13,924	13,206	12,031	11,036	99,680
Gross import cost ¹ -----	\$13,333	\$36,850	\$44,700	\$29,126	\$28,327	\$25,670	\$24,086	\$202,092
Sales value-----	\$9,878	\$28,944	\$34,054	\$20,497	\$20,100	\$18,255	\$16,711	\$148,438
Net import cost-----	\$3,454	\$7,906	\$10,647	\$8,629	\$8,227	\$7,415	\$7,375	\$53,653
Gross import price ¹ -----	\$5.87	\$6.68	\$7.09	\$7.59	\$7.49	\$7.52	\$7.40	\$7.12
Sales price-----	\$4.35	\$5.25	\$5.40	\$5.34	\$5.32	\$5.35	\$5.14	\$5.23
Net import cost per hundredweight-----	\$1.52	\$1.43	\$1.69	\$2.25	\$2.18	\$2.17	\$2.27	² \$1.89
Imports charged to producers, pounds-----	246,741	541,206	637,247	468,963	483,407	417,870	492,427	3,287,861
Cost per hundredweight-----	\$1.40	\$1.46	\$1.67	\$1.84	\$1.70	\$1.77	\$1.50	² \$1.63
Charges-----	\$3,454	\$7,906	\$10,647	\$8,629	\$8,227	\$7,415	\$7,375	\$53,653

¹In a few cases, the sum of sales and net import cost figures differ from gross import figures due to rounding.

²This is the average net import cost per hundredweight, calculated as quotient of net import cost and hundredweights of milk imported. The average net cost per hundredweight of importing one hundredweight each day or each month is \$1.93 and \$1.62 as charged to producers.

SOURCE: Association records.

The price of imported milk f.o.b. point of origin was less than the local producer price. To this cost must be added, however, transportation charges, telephone calls, and other incidental expenses connected with the operation. Also included in the net cost to the association is the cost of distributing imported milk to dealers in Memphis. Imported milk is trucked in and delivered to one plant. From there it is redistributed to other dealers in cans. This redistribution service is paid for by the association and is treated as part of the import costs. The sales price and sales value of imports are determined by the Class I Memphis price paid local producers adjusted for the appropriate butterfat content. A small amount of shrinkage and Class II utilization further modify the sales price and value slightly.

IMPORTS AND UNDERQUOTAS

Imports never reached the full quantity of undelivered quotas in any month (table 6). Underquota producers therefore bore the entire cost. Moreover, the net import costs incurred by the association were assessed to underquota producers on only a fraction of their undelivered quota. Thus, the association assessed underquota producers on 25 percent of their undelivered quota in September and December 1947 and in January and February 1948. It assessed on 33-1/3 percent of their undelivered quota in October and November 1947 and in March 1948. Assessments were made on 60 percent of the undelivered quota in October, on 75 percent in November, and on 70 percent in December 1948. These percentages, which were used by the association, represent convenient approximations to the actual fractions which imports were of undelivered quotas.

In order to obtain the exact reimbursement for net import costs, the penalty *rate* per hundredweight was determined as the quotient of net import costs and the amount of imports used for assessment purposes. This amount of "bookkeeping imports" slightly exceeded the amount of actual fluid imports in most months so that the assessment or penalty rate tended to be slightly lower than net import costs per hundredweight (table 7). Thus, the average net import cost per hundredweight during the 1947-48 import season was \$1.89 compared with an average assessment of \$1.63. The actual net cost of importing one pound of milk daily from September 1947 to March 1948, that is 213 pounds of milk, amounted to \$4.11. One pound of imports charged to an underquota producer under the accounting procedure of the association each day during the 213 day import season meant a penalty of \$3.45. But since one pound of quota that was not delivered throughout the 1947-48 import season required only a fraction of a pound of daily imports, the penalty charge for one pound of shortage (in contra-distinction to one pound of imports) throughout the season was 98 cents.

Milk deliveries by producers for the month of April 1948 as a whole exceeded Class I sales by the association. During the first week of the month, however, two tank trucks of milk had to be imported. The milk pool is a monthly pool in every respect and penalties are incurred according to *monthly* underquota deliveries. Thus nobody had incurred

Table 8. - Fluid milk and skim milk imports to Memphis under the new plan, September 1948 to December 1948

	SEPTEMBER ¹	OCTOBER	NOVEMBER	DECEMBER	TOTAL FOR OCT.-DEC.
Milk or skim milk imported, pounds-----	18,311	529,230	1,104,576	962,781	2,596,587
Percent of quota-----	0.2	6.1	13.1	11.0	10.4
Butterfat, imported, pounds--	732	18,921	25,039	21,130	65,090
Gross import cost-----	(2)	\$39,000	\$60,758	\$48,947	\$148,705
Sales value-----	(2)	\$30,596	\$50,872	\$43,687	\$125,155
Net import cost-----	(2)	\$8,404	\$9,886	\$5,260	\$23,551
Gross import price-----	(2)	\$7.37	\$5.50	\$5.08	\$5.73
Sales price-----	(2)	\$5.78	\$4.61	\$4.54	\$4.82
Net import cost per hundredweight-----	(2)	\$1.59	\$0.89	\$0.54	\$0.91
Imports charged to producers, pounds-----	None	542,208	1,098,440	956,449	2,597,097
Cost per hundredweight-----	None	\$1.55	\$0.90	\$0.55	\$0.91
Charges-----	None	\$8,404	\$9,886	\$5,260	\$23,551

¹Due to the small volume of September imports, no penalties were assessed and costs were defrayed from the settlement fund reserves during that month.

²Not available.

SOURCE: Association records.

penalties over the month as a whole. The board of directors decided to finance the importation of these two tank trucks by a special one cent per hundredweight deduction from all milk checks. This was a simple, practical solution even though it meant that the penalty provision of the base-quota plan was disregarded to the extent that underquota deliveries during the first week of the month went unpenalized. A similar situation in September 1948 was handled in the same manner.

Class I sales in April 1948 equaled 110 percent of producers' quotas. The Memphis base-quota plan provides that any overquota milk deliveries shall be paid at a blend price made up of overquota Class I sales and Class II sales. The board of directors of the association disregarded this provision and paid producers for milk at the Class I price up to 110 percent of their quotas. Similarly, the association paid the Class I price for 105 percent of quotas in May, June, and July 1948. This practice tended to give a slight advantage to producers whose milk deliveries were only slightly in excess of their quotas as compared with producers whose milk deliveries substantially exceeded their quotas. For example, the producer whose milk deliveries were 110 percent of his

Table 9. - Monthly penalty payments under the plan compared to producers' receipts¹

YEAR AND MONTH	PENALTIES	RECEIPTS ¹	PENALTIES AS PERCENTAGE OF RECEIPTS
1947 Sept.-----	\$3,454	\$490,224	0.7
Oct.-----	7,906	509,432	1.6
Nov.-----	10,647	483,256	2.2
Dec.-----	8,629	499,334	1.7
1948 Jan.-----	8,227	495,857	1.7
Feb.-----	7,415	471,426	1.6
Mar.-----	7,375	515,237	1.4
Apr.-----	-	555,755	
May-----	-	597,431	
June-----	-	546,762	
July-----	-	563,336	
Aug.-----	-	611,240	
Sept.-----	-	581,032	
Oct.-----	8,404	462,774	1.5
Nov.-----	9,886	498,000	2.0
Dec.-----	5,260	526,249	1.0
Sept. '47 to Dec. '47	30,636	1,982,247	1.5
Sept. '47 to Mar. '48	53,653	3,464,767	1.5
Year 1948-----	46,568	6,525,098	0.7
Sept. '48 to Dec. '48	23,551	2,168,054	1.1

¹Receipts are defined as milk payments after deduction of the 7 cent per hundredweight service charge received by the association from dealers but before any other deduction. Thus penalty payments have not been deducted. Receipts as here used also contain the 2 cent per hundredweight revolving fund withholding and smaller withholding for audit adjustment reserves.

SOURCE: Association records.

quota received the Class I price for all of his deliveries rather than the lower blend price for the extra 10 percent.

QUOTA CHANGES

The quota book of the association shows 386 changes from the original 1947 quotas to the new quotas that became effective on April 1, 1948, and two cases of no change (table 10). There were 450 individual original quotas and 470 individual new quotas. Thus 62 holders of original quotas (450 minus 388) transferred their quotas to others without retaining any portion of them and 82 holders of new quotas (470 minus 388) had not had any original quota. The average change in quotas of the 388 continuous producers amounted to 127 pounds. Decreases in the quota outnumbered increases 280 to 106. Most changes were small.

Table 10. - Differences between original (1947) and new (1948) quotas under the Memphis plan.

DIFFERENCE	NUMBER OF PRODUCERS
<i>Pounds</i>	
-1700 to -401-----	17
- 400 to -301-----	11
- 300 to -201-----	28
- 200 to -101-----	70
- 100 to -1-----	154
no change-----	2
1 to 100-----	73
101 to 200-----	17
201 to 300-----	8
300 to 600-----	8
Total decreases-----	280
No change-----	2
Total increases-----	106
Total-----	388

Compiled from association records.

The largest number of changes were quota decreases ranging from 1 to 100 pounds (table 10). Approximately 59 percent of the quotas did not change by more than 100 pounds. These changes mark the difference between the original, *selected* 1947 quotas and the new 1948 quotas *earned* according to September through February deliveries plus imports and sometimes modified by quota credit transfers. There were 27 first changes of the new quotas during April and May 1948, the first two months after they had taken effect, 17 of these were increases and 10 decreases. There were two second changes of the new quota during these two months.

PRODUCERS' OPTIMUM QUOTA

Producers, as a group, selected quotas in May 1947 which they were unable to fill from September 1947 to March 1948. The time quotas were selected, at the height of the seasonal peak of milk production, may have made dairymen too optimistic. However, given a certain degree of unavoidable seasonal fluctuation, producers may have considered that a certain amount of penalty charges could well be financed from Class I price differentials over the Class II price at which overquota milk was paid. A large individual quota meant that a relatively small amount of milk had to be sold at the Class II price. This advantage had to be

weighed against the offsetting disadvantage of a larger penalty liability than if the quota had been smaller.

Producers as a whole would have been charged with about the same import costs if their individual quotas had exactly equalled their average daily deliveries from September 1947 through February 1948. The plan specifies that if Class I sales during the quota-forming period exceed the sum of all quotas plus overquota deliveries, the excess shall be prorated to all producers. In that case, each producer would have met his original quota, but would have been charged with his prorated share of the import cost of above-quota market requirements.

Nevertheless, the individual producer may act wisely, under certain conditions, if he maintains a relatively large quota. A wide milk price differential between Class I and Class II milk favors a larger quota, because each additional pound of milk sold at the higher Class I price, rather than at the lower Class II, may mean more revenue than the cost of the additional penalties that might be incurred with a larger quota in fall and winter. If overquota milk deliveries are partially paid at the Class I price as was the case during the flush season of 1948, the effect is the same as if the Class I - Class II milk price differential were narrower. High import costs per hundredweight and a large proportion of fluid imports relative to the total amount of undelivered quota milk should discourage any upward adjustment of an individual's quota. The individual producer's seasonal milk delivery pattern is a most important consideration. It would be foolish to acquire additional quota that is so high that full delivery can be made only during a few weeks in spring and that penalties must be incurred for it throughout the low production season. But it may be wise for a dairyman to obtain some additional quota if he can make full delivery on it for most of the year and if his undelivered quota is likely to be small.

SAMPLE OF 94 PENALTY ACCOUNTS

To determine the effect of penalties, the accounts of 94 producers were selected as a systematic random sample¹¹ and studied. Eight of these 94 producers incurred no penalty throughout the season. Five of these eight producers started operations during the low production season and judiciously avoided obtaining daily quotas which exceeded their ability to deliver. Only three producers, who had selected their quotas before the beginning of the short season, incurred no penalty whatsoever and, as a result of above-quota deliveries, earned new quotas in excess of the original ones.

New quotas in the sample average 88 percent, and range from 32 to 211 percent of the old, original quotas. There were seven instances in

¹¹The sample was obtained by selecting every fifth producer whose account sheet was in the active file on July 19, 1948. Producers' accounts in the file were arranged in order of their Health Department permit number. The first record pulled was randomly determined as the fifth record in the file.

which the quota did not change by more than one-half percent and for three quotas no precedent existed. There were only 18 increases compared with 66 decreases. Most of these decreases were moderate; 40 new quotas are between 84 and 99 percent of the original quotas. It must be kept in mind that these percentages do not furnish an accurate measure of the extent to which producers delivered their full, original quotas, since they are padded by the inclusion of "bookkeeping" imports.

A frequency distribution of the percentages of undelivered portions of quotas relative to full, theoretical quota deliveries from September 1947 to March 1948, is shown in table 11.

For the entire sample, 17 percent of the full quota was not delivered. Five percent of the quota was charged as penalties. The 83 percent of quota delivered, plus 5 percent of quota imported, add up to 88 percent - the percentage the new quota is of the old quota for the sample as a whole.¹²

The individual percentages in table 11 were, as a rule, calculated relative to quota deliveries only, that is, relative to the daily quota times 213. Or, in the case of a few producers who began operations during the period, it was the daily quota, times the number of days since they had entered the market. In fifty cases, actual deliveries exceeded the quota amounts in some months. Thus the percentages calculated in these fifty cases were different from and exceeded those one could calculate from their quota amounts plus their overquota deliveries. There were 5 cases involving quota changes, the date of which was not known. Therefore, the percentages had to be computed from total actual deliveries plus total shortages in these cases. Almost one-fourth of the producers included in the sample fell short of their deliveries by not more than 4 percent, if at all; nearly one-half of them did not fall short by more than 12 percent and fifty-eight of them, that is more than 60 percent, did not fall short by more than 18 percent, the aggregate percentage of quota which was not delivered. A few producers with very large percentages of undelivered quota influenced the aggregate greatly.

If penalties are related to net receipts,¹³ a variation is found that ranges from no penalties to penalties amounting to 11 percent of net receipts (table 12). The average, computed by adding penalty charges, adding net receipts, and dividing the former by the latter, is 1.59 percent, almost identical with 1.57, the percentage of the penalties paid by all producers from September 1947 to March 1948 relative to total net receipts.

¹²The month of March is outside the quota-forming period; but a substantial part of the quota was not delivered and imports were necessary during that month. It so happens that the percentages given here apply to the 6-month quota earning period, September to February, and also to the 7-month import season September to March.

¹³"Net receipts" as used here are identical with the item "Gross Amount" on the Mid-South Milk Producers Association Memorandum and Statement for Producers. It is the total gross payment due a producer minus penalties for underquota deliveries; the service charge paid by distributors which is not even shown on the memorandum and statement is also excluded. However, all other deductions such as hauling and Dairy Herd Improvement Association charges are still included.

Table 11. - Frequency distribution of undelivered quota portions as percentages of full, theoretical quota deliveries, sample of 94 producers, September 1947 to March 1948, Mid-South Milk Producers Association.

PERCENTAGE DIFFERENCE BETWEEN THEORETICAL QUOTA DELIVERIES AND ACTUAL, SEPTEMBER 1947 TO MARCH 1948, DELIVERIES	NUMBER OF PRODUCERS	CUMULATIVE TOTAL OF PRODUCERS
0-----	9	9
1 - 2-----	7	16
3 - 4-----	7	23
5 - 6-----	3	26
7 - 8-----	4	30
9 - 10-----	10	40
11 - 12-----	6	46
13 - 14-----	5	51
15 - 16-----	5	56
17 - 18-----	2	58
19 - 20-----	0	58
21 - 22-----	7	65
23 - 24-----	5	70

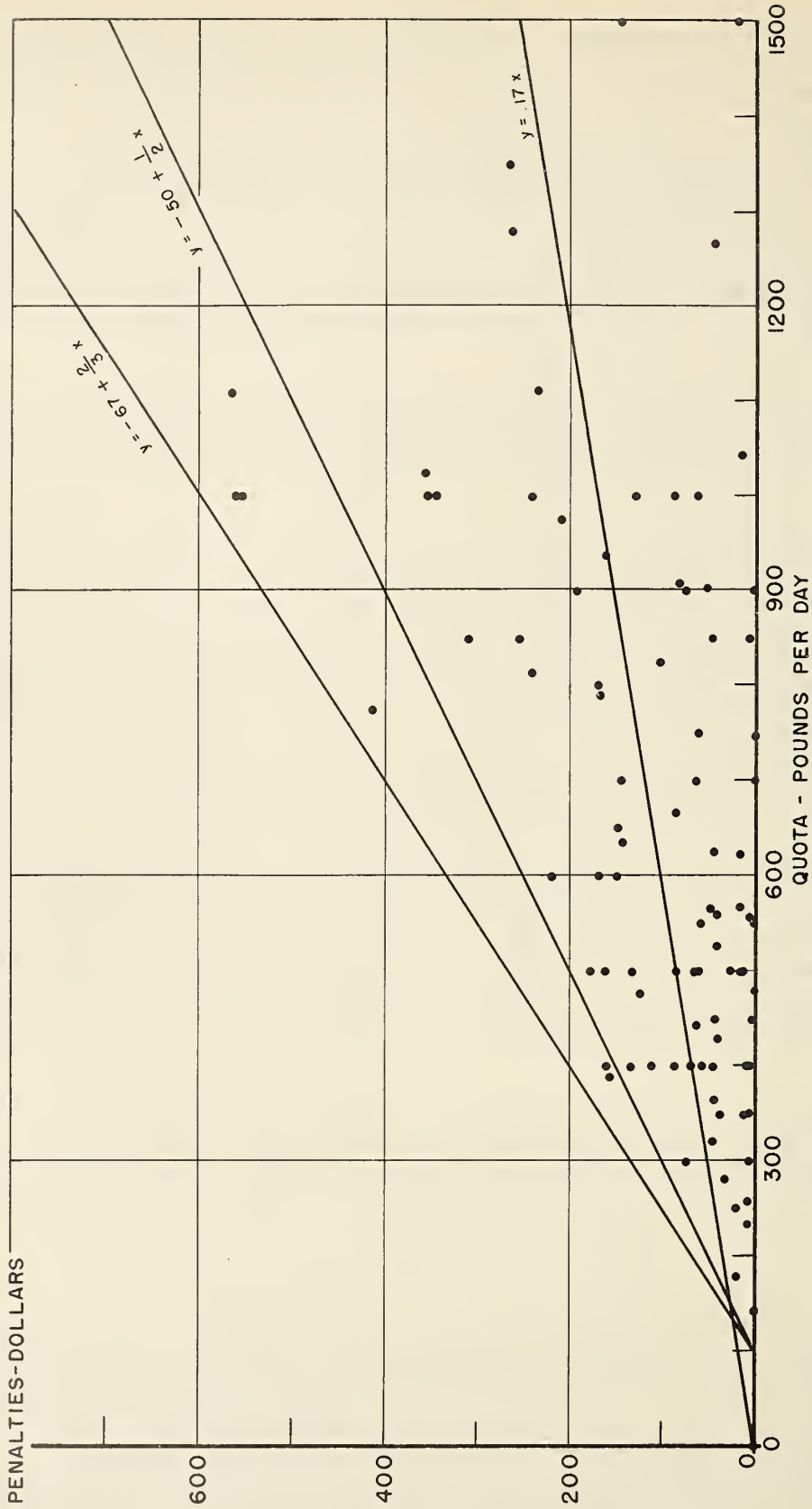
25 - 28-----	7	77
29 - 32-----	5	82
33 - 36-----	3	85
37 - 40-----	3	88
41 - 44-----	2	90
45 - 48-----	1	91
49 - 52-----	2	93
53 - 56-----	1	94
Total-----	94	

Based on association records.

If there were not much difference between producers' *relative* penalty payments (percentages of their net receipts), the actual amounts of penalty paid would tend to increase as the daily quota increases. In other words, the dots in figure 2 would tend to lie close to a line in that case. In reality, the dots in figure 2 are scattered widely. However, all eight cases of very large penalty charges...more than \$300 for the seven months...are associated with daily quotas of more than 750 pounds. The twelve producers with daily quotas of less than 400 pounds incurred penalties of less than \$80 (fig. 2). Aside from these two

FIGURE 2

RELATIONSHIP OF SELF-CHOSEN DAILY QUOTA AND PENALTIES INCURRED DURING THE SEASON SEPT., 1947 TO MARCH, 1948 MEMPHIS MILK MARKET- SAMPLE OF 94 PRODUCERS



NOTE: IN CASES OF QUOTA ADJUSTMENT THE QUOTA WHICH WAS IN FORCE DURING MOST OF THE SEASON WAS TAKEN.
3 PRODUCERS HAD NO QUOTAS AND NO PENALTIES. SOURCE: BASED ON ASSOCIATION DATA.

observations there is a wide scatter of the amount of penalties incurred with any given quota.¹⁴

No seasonal penalty exceeded \$.67 for each pound of quota above 100 pounds and there were only six instances among the 94 cases in the sample, in which the seasonal penalty exceeded \$.50 for each pound of quota above 100 pounds. (These two statements are graphically expressed in figure 2 by the two lines labeled $y = -.67 + 2/3x$ and $y = -.50 + 1/2x$.) Beginning with 100 pounds of quota and no penalty to pay each additional 100 pounds of quota would probably have resulted in not more than \$50 of penalty from September 1947 through March 1948. One thousand pounds of quota are in no case associated with more than \$600 of penalty and all but two producers with 1,000 pounds of quota incurred penalties of less than \$450.

In the average of the sample each pound of quota was associated with a seasonal penalty of 17 cents. (This is graphically expressed in figure 2 by the line labeled $y = .17x$. The reader can ascertain the average penalties incurred with any given quota by reading off the horizontal and vertical values on any point of the line; for instance 500 pounds of quota were associated, in the average, with \$85 of penalties and 1,000 pounds of quota were associated in the average with \$170 of penalties.) It should be kept in mind that the penalties per pound of quota paid by most producers varied widely from this average as shown by the wide scatter from the line denoting the average as shown in figure 2. This average of 17 cents of penalty payments per pound of quota held not only for the sample, but also for the entire

¹⁴One might infer an association between amount of penalty and amount of quota by grouping the 94 sample data by 200-pound classes of quota as follows:

QUOTA POUNDS	PENALTY, AVERAGE FOR CLASS	NUMBER OF PRODUCERS
No quota.....	0	3 (excluded from avg.)
100 - 299.....	\$16.47	6
300 - 499.....	59.36	23
500 - 699.....	82.18	24
700 - 899.....	143.56	14
900 - 1099.....	207.04	17
1100 - 1299.....	279.45	4
1300 - 1499.....	268.30	1
1500.....	84.54	2
Average - 663.7.....	115.62	94

There is a regularity of increase in average penalty with succeeding quota classes up to 1,300 pounds. However, these averages are not typical at all. They do not describe typical penalty amounts within their classes. The writer believes that the wide distribution of the observations as shown in figure 2 is more significant than the average penalties shown in this footnote. The most noteworthy fact seems to be that aside from the lacking association of large penalties with small quotas, any amount of penalty can well be associated with any amount of quota.

Table 12. - Penalties as percentages of net receipts,¹ sample of 94 producers, Mid-South Milk Producers Association, September 1947 to March 1948

PENALTIES PAID, PERCENT OF NET RECEIPTS ¹	NUMBER OF PRODUCERS	PERCENT OF SAMPLE PRODUCERS	CUMULATIVE PERCENT OF SAMPLE PRODUCERS
0-----	27	29	29
1-----	29	31	60
2-----	12	13	73
3-----	12	13	86
4-----	5	5	91
5-----	4	4	95
6-----	1	1	96
7-----	1	1	97
8-----	0	0	97
9-----	2	2	99
10-----	0	0	99
11-----	1	1	100
average 1.59----	94	100	

¹See footnote 13.

Based on association records.

market. The sum of all penalties paid divided by the sum of the quotas yielded a quotient of 17 cents of penalty payments per pound of quota.

The 94 producers included in the sample had to pay \$10,521 of penalties, that was \$115.62 per quota-holding producer or \$122.34 per penalty paying producer. Since all producers delivered 56,624,742 pounds of milk and paid \$53,653 in penalties, from September 1947 to March 1948, the average penalty amounted to 9.5 cents per hundredweight of milk marketed. All these averages are not typical values by any means, but they can serve as yardsticks to an individual producer who wishes to know how his penalty account compares with others.

Eleven producers in the sample were found to have changed their quotas after their initial quota selection in May 1947 and before the new quotas became effective April 1, 1948. These changes were effected by quota transfers. Four producers increased their quotas, six decreased them, and one decreased his but soon raised it to its original level. Increasing one's quota was unnecessary for established producers in the sense that all milk was paid at the quota price throughout the shortage season from September to March, whether it was quota or overquota. However, producers who could not meet their quotas and became subject to penalties may have been willing to pay a reasonable sum to fellow producers for assuming a part of their excess quota and thus helping them to avoid penalties. Often quotas seem to have been transferred without any monetary consideration being involved.

In a tally of the percentages of monthly penalties relative to seasonal total penalties for the 86 penalty paying producers in the sample, zero percent was the modal or most frequent percentage in each month. Only 33 producers incurred penalties all 7 months of the season, 13 producers incurred penalties in 6 months, and 40 producers in 1 to 5 months of the season.

EFFECT ON SEASONALITY OF MILK PRODUCTION

Producers' milk deliveries by months during the first year of the new plan, exceeded those of the corresponding month of the preceding year (table 13). The increase over the preceding month was particularly pronounced during the fall months, an indication that the initial effect of

Table 13. - Producers average daily milk deliveries, by months April 1947 to December 1948, relative to corresponding month April 1946 to March 1947, Memphis.

MONTH	DELIVERIES OF MILK				
	POUNDS 1946-47	POUNDS 1947-48	POUNDS 1948-49	1947-48 AS A PERCENTAGE OF 1946-47	1948-49 AS A PERCENTAGE OF 1946-47
April-----	252,475	¹ 290,102	324,372	¹ 114.9	128.5
May-----	269,923	338,759	347,389	125.5	128.7
June-----	270,851	353,832	325,075	130.6	120.0
July-----	280,348	351,962	325,830	125.5	116.2
August-----	269,935	312,962	331,061	115.9	122.6
September-----	238,435	293,922	306,634	123.3	128.6
October-----	202,219	264,861	271,881	131.0	134.4
November-----	187,517	253,024	246,729	134.9	131.6
December-----	188,594	254,745	253,689	135.1	134.5
January-----	200,014	255,789		127.9	
February-----	223,366	259,805		116.3	
March-----	241,845	278,864		115.3	
5 spring-summer surplus months					
Apr. - Aug.-----	268,799	329,622	330,824	122.6	123.1
7 fall-winter import months					
Sept. - March-----	211,536	265,844		125.7	
4 fall-winter import months					
Sept. - Dec.-----	204,047	266,526	269,619	130.6	132.1
12 months-----	235,539	292,505		124.2	

¹April 1947 milk deliveries were not paid for on the basis of the new plan.

Computed from association records.

the plan was to obtain greater supplies of local milk for the market when they were needed most. Milk deliveries from April to August in 1948 were approximately the same as in 1947; in both years milk deliveries amounted to 123 percent of deliveries for the same period in 1946.

The accomplishment of the fall of 1947 was not repeated in 1948. Milk deliveries by local producers in the fall of 1948 showed little or no improvement over 1947. Producers' milk deliveries in September and October were larger in 1948 than in 1947, but in November and December, they were lower.

In order to estimate more accurately the effect of the plan upon the pattern of seasonality indexes of the seasonal variation of milk deliveries in the Memphis milkshed have been constructed.

Two periods can be distinguished in the seasonal pattern of milk deliveries in the Memphis milkshed since 1938. The first period is from 1938-43 in which seasonal swings in production were moderate. The index for that period ranged from a high of 106.6 in May to a low of 94.9 in November (table 14 and fig. 1). The second period begins in the spring of 1943 and continues through 1948. This period is characterized by much more violent swings in seasonality of production. The index of seasonal variation for this period ranges from a peak of 119.1 in June to a low of 82.8 in December. The seasonal high and low points occur one month later than in the 1938-1943 series.

The indexes for the year from June 1947 to May 1948 and for the calendar year 1948 confirm the impression that seasonal fluctuations in milk deliveries have declined, at least to some extent, since the new plan went into effect. The index for each month, October 1947 to January 1948, is higher than the corresponding 1943-1948 5-year average for the month (table 14). May to July 1948 indexes are lower than the corresponding 1943-1948 averages. This too indicates a reduction in the seasonal variation of milk deliveries. The November 1948 index of 84 marks a setback, however.

The high and low points of the annual seasonal movement shifted back to May and November in 1948. It should be considered desirable to reverse the seasonal downward trend in production as early as possible each year; similarly, an early leveling off in the seasonal upward trend in spring may help to maintain a more even summer flow.

The difference between the seasonal fluctuation in milk deliveries under the plan and the 5-year 1943 to 1948 average is more apparent if amplitude ratios are constructed.

If the seasonal fluctuation in a particular year corresponded exactly with the average seasonal pattern, the amplitude ratio would have a value of one. In years when the seasonal fluctuation has a greater amplitude than the standard seasonal pattern with which it is compared, the amplitude ratio will exceed one, and when the fluctuation in the

Table 14. - Indexes of seasonal variation in average daily deliveries of local wholesale milk by months, Memphis, 1938-48

MONTHS	ENTIRE PERIOD	PERIOD OF MODERATE SWINGS	PERIOD OF WIDE SWINGS	JUNE 1947 TO MAY 1948	CALENDAR YEAR 1948
	FEBRUARY 1938 TO JUNE 1948	FEB. 1938 TO MARCH 1943	APRIL 1943 TO MAY 1948		
January-----	91.6	96.8	83.5	86.0	86.8
February-----	93.3	96.7	88.3	87.4	88.2
March-----	95.4	97.9	95.0	93.5	94.8
April-----	105.7	101.9	110.6	108.7	110.3
May-----	111.8	106.6	118.5	116.0	118.2
June-----	110.9	104.5	119.1	120.9 ¹	110.6
July-----	109.7	103.9	116.3	120.0	110.9
August-----	105.9	104.4	110.8	106.5	112.7
September-----	100.3	100.6	101.9	99.8	104.4
October-----	93.8	95.5	88.5	89.8	92.6
November-----	90.6	94.9	84.7	85.4	84.0
December-----	91.0	96.2	82.8	85.9	86.5

¹June 1947 is first month in this column.

Calculated by the link relative method from data obtained from association records.

individual year is less than that of the standard, it will be less than one.¹⁵ The amplitude ratios within the periods from 1939 to 1942 and from 1944 to 1947 were rather uniform, but there was a great difference between these two periods (see first column of table 15).

The most interesting feature of table 15 is the decrease of the amplitude ratio in 1947-48. The amplitude ratios of .88, .95, and .83, respectively, at the bottom of the two right-hand columns in the table are the lowest amplitude ratios since 1944. They may indicate that the amplitude of seasonal fluctuation is returning to a more moderate pattern. Yet this is by no means certain. Unless subsequent developments reduce the amplitude ratio further, these most recent measurements will still fall within the pattern set by the last 5 years.

Table 15. - Amplitude ratios indicating the seasonal fluctuation of local deliveries of wholesale milk in individual years relative to the average seasonal fluctuation during specified periods, Memphis, 1938-48.

YEAR	MOVING AVERAGE METHOD BASED ON:			LINK RELATIVE METHOD BASED ON:
	JULY 1938 TO MARCH 1948	JULY 1938 TO MARCH 1943	APRIL 1943 TO JAN. 1948	APRIL 1943 TO MAY 1948
1939-----	.38	.89	-	-
1940-----	.41	.99	-	-
1941-----	.43	1.02	-	-
1942-----	.48	1.09	-	-
April 1942 to March 1943---	-	1.07	-	-
1943-----	.92	2.09	-	-
April 1943 to March 1944---	-	2.38	.70	-
June 1943 to May 1944-----	-	-	-	.88
1944-----	1.44	-	.93	-
June 1944 to May 1945-----	-	-	-	.98
1945-----	1.60	-	1.04	-
June 1945 to May 1946-----	-	-	-	1.08
1946-----	1.79	-	1.17	-
June 1946 to May 1947-----	-	-	-	1.32
1947-----	1.77	-	1.14	-
May 1947 to April 1948-----	-	-	1.06	-
June 1947 to May 1948-----	-	-	-	.95
July 1947 to June 1948-----	-	-	.88	-
1948-----	-	-	-	.83

Calculated from data in tables 13 and 14 and from delivery data as shown in figure 1.

¹⁵This measure was developed by S. Kuznets in *Seasonal Variations of Industry and Trade*, Publication 22, National Bureau of Economic Research, p. 324, and has been used by others since then.

There remains the question of whether the reduction in seasonality of milk deliveries which seems to have occurred has been brought about by means of the strategic timing of the admission of new producers, or whether it has been brought about through a reduction in the seasonality of production of the individual producers.

The tendency of the average number of producers to be somewhat larger during spring and summer (table 2) leads to the inference that the improvement is not the result of the strategic timing of the admission of new members. For this to be the factor, the seasonal high point in the number of producers would have to occur in the fall.

An analysis of changes in the index of seasonal variation of average daily milk deliveries per producer under the plan confirms the conclusion that the improvement in the seasonal pattern of milk deliveries has been brought about by a reduction in the seasonal fluctuation of milk deliveries of the individual producers. The index of seasonal variation per producer for each month during the fall of 1947 was higher than that for all producers, and in May, June, and July 1948, the index per producer was lower than that for all producers (table 16).

Another measure of the effect of the new plan is the percentage of dry cows relative to all cows as calculated from returns of a monthly post-card survey which has been conducted by the association since early in 1946. The time series of these percentages has seasonal peaks in late fall and winter which indicate the predominance of late winter freshening. In order to level out milk production, emphasis on late summer and early fall freshening is desirable, and substituting even year-around freshening for heavy late-winter calving is a minimum requirement. The fall-winter peak in percentages of dry cows has been greatly

Table 16. - Indexes of seasonal variation of average daily milk deliveries of all producers and per producer, Memphis, by months, April 1943 to May 1948 and June 1947 to May 1948.

MONTH	MILK DELIVERIES			
	APRIL 1943 TO MAY 1948		JUNE 1947 TO MAY 1948	
	ALL PRODUCERS	PER PRODUCER	ALL PRODUCERS	PER PRODUCER
June-----	119.1	117.9	120.9	119.6
July-----	116.3	115.4	120.0	118.2
August-----	110.8	109.1	106.5	106.2
September-----	101.9	100.6	99.8	99.6
October-----	88.5	88.3	89.8	90.4
November-----	84.7	85.0	85.4	86.9
December-----	82.8	84.2	85.9	87.7
January-----	83.5	85.7	86.0	87.2
February-----	88.3	89.3	87.4	88.2
March-----	95.0	95.6	93.5	93.0
April-----	110.6	111.1	108.7	108.1
May-----	118.5	117.9	116.0	114.9

Calculated by the link relative method from association data.

reduced, while higher spring 1948 percentages indicate increased summer freshening (fig. 3). Nevertheless, during the year 1947-48 there was still a very pronounced winter peak. Continued efforts will be necessary to flatten this peak still more in the future. There was also a general decrease in the percentage of dry cows from January 1947 to March 1948; except for May the percentage was lower in each month during that period than a year earlier. This may have been due to the sale for slaughter of a relatively small number of nonbreeding dry cows or it may have been due to a shortening of the dry period for all cows in calf.

EVALUATING RESULTS OF THE PLAN

A substantial increase in milk production occurred in the Memphis milkshed during the fall and winter months of 1947-48 ... the first year the present seasonal milk pricing plan was in operation. The gains in production during the first year were barely held during the first four months of the short production season for 1948-49. Nevertheless a decline in seasonality of production appears to have occurred.

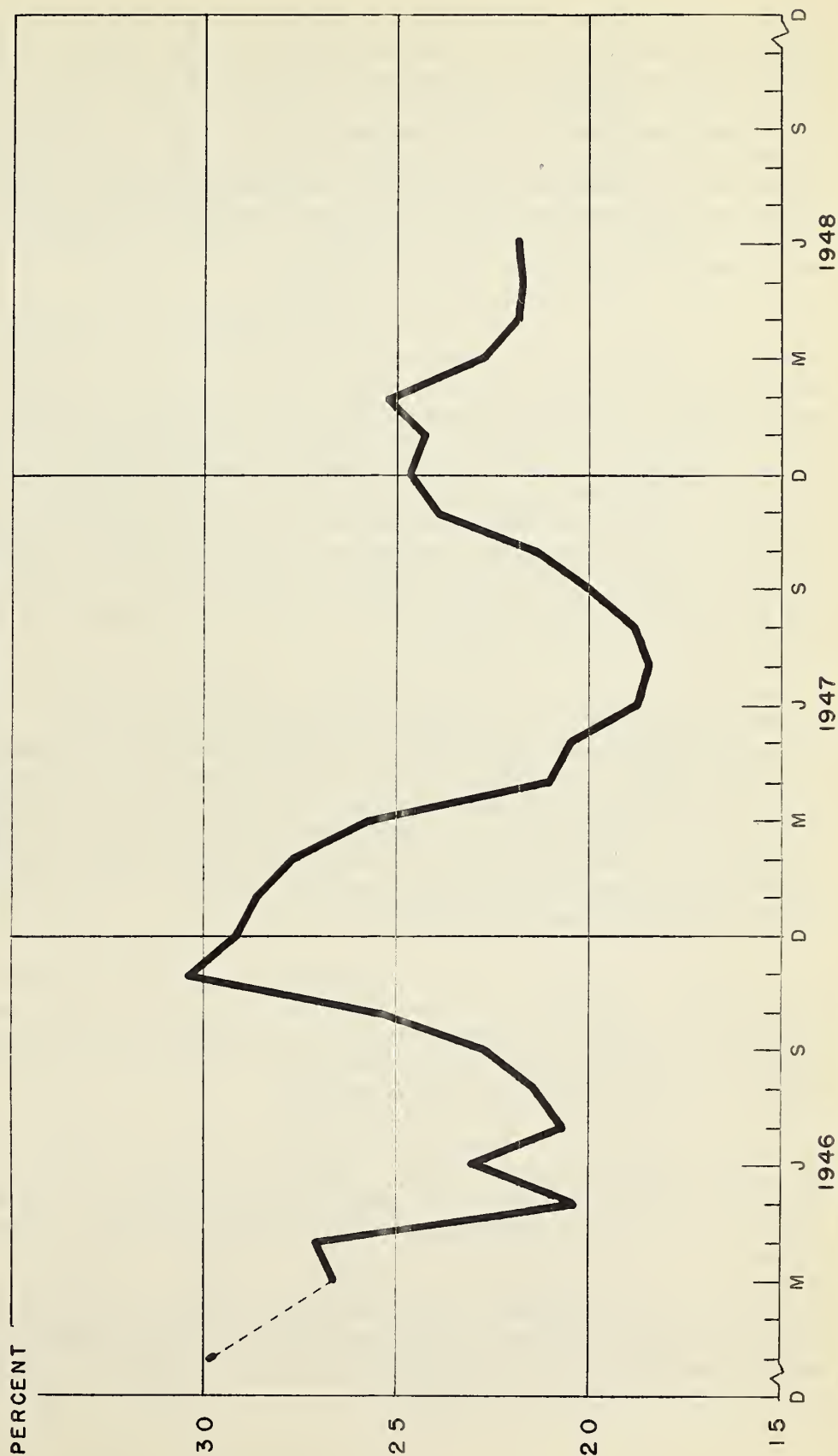
The Memphis base-quota plan was the product of special circumstances in the market which limits its applicability to other markets. In the first place, it is obvious that the special penalty features of the plan have meaning only in a market which must rely on sources of supply outside the milkshed for a part of the year. Further, the plan could work only in a market where producers were organized into an effective bargaining association equipped to perform such functions as check weighing and testing, auditing dealers' usage records, operating a marketwide producer settlement fund, and importing deficit supplies during the short season. There must be complete acquiescence on the part of the milk distributors in the market to the performance of these functions by the cooperative and the cooperative must have supply contracts with all or most of the distributors in the market.

There are several problems in administering the plan. The total of the quotas must approximate the volume of Class I sales or else the principles of the plan are not effective. This is due to the fact that, if Class I sales greatly exceed quotas, overquota milk deliveries are paid at the Class I price. This was the case during the war years. On the other hand, if Class I sales amount to much less than the combined quotas, the difference between quota and overquota prices may become very small. Since quotas are determined annually, a certain degree of automatic quota adjustment is provided. Nevertheless difficult situations may arise either when the new quotas are first announced in the spring of the year or during the course of the following fall and winter season, if these quotas prove insufficient. Producers may object to having quotas assigned which are more than the amounts determined as their average daily deliveries during the quota earning period.

The plan provides that the association may permit each producer to refuse any upward adjustment of his new quota. As the plan is now formulated, this privilege can be granted only if other producers are willing to add such refused quotas to their own. Otherwise, larger quotas

FIGURE 3

PERCENTAGE OF DRY COWS IN HERDS, MONTHLY POSTCARD
SURVEY, MID-SOUTH MILK PRODUCERS ASSOCIATION
MEMPHIS, 1946-48



SOURCE: FROM ASSOCIATION RECORDS

have to be forced on producers in order to distribute the losses from fluid milk imports which the association may have to incur. It is important to avoid an unpopular situation of this kind. This can be done (a) by expanding membership and (b) by financing overquota fluid milk imports from the producer settlement fund by deducting the necessary expenditure from all milk payments. The small amounts of fluid milk imports required in April and September 1948, when quotas for the month as a whole were fully delivered, were financed in this manner. It might be advisable to modify the plan so that no unearned quota assignment need ever be forced upon a producer.

When the plan in its present form was adopted, the producer settlement fund did not have the substantial reserves which have since been accumulated. With its present settlement fund reserves the association can well afford to absorb losses on fluid milk imports which are caused by expanding Class I sales rather than by nondelivery of quotas. The ultimate impact on producers of import financing without specific reimbursement would be approximately the same as under present provisions of the plan. Under present provisions, overquota fluid imports would be financed by general quota expansion which would mean a deduction from "take-home" milk payments. Under the suggested setup, overquota fluid imports would be financed by a deduction from each producer's equity in the producer settlement fund.

Since the proportion of a producer's quota, relative to all quotas, should approximate the proportion which his current year accumulations in the producer settlement fund are of all producers' accumulations, the ultimate impact of overquota import financing would be about the same. However, the suggested method is more likely to avoid misunderstanding and friction. An effort should be made, of course, to obtain price increases from dealers and to finance overquota fluid milk imports indirectly in this fashion when expanding Class I milk demands in the market make such imports necessary.

If the plan is changed in the suggested manner, it should be clearly stipulated, however, that only quota in excess of the amount earned during the quota earning period may be refused by a producer. If a producer *earned* a larger quota than the one he had during the preceding quota year, he should have to accept it.

In this connection, the association may wish to reformulate the manner in which new quotas are earned. Under the present plan the excess of Class I sales over milk deliveries during the quota earning period (September through February) is to be added to the deliveries of *all* producers for calculating new quotas. However, when new quotas were determined in the spring of 1948, Class I sales in excess of local milk deliveries from September 1947 through February 1948, that is fluid milk imports, were all added to the deliveries of only those producers who had to pay for them. This practice has the tendency of preventing new quotas from dropping too sharply.

For instance, if Farmer Smith delivered 80 percent of his quota from September 1947 through February 1948 and had to pay penalties on 6 percent of his quota, his new quota was determined as 86 percent of his original quota. If it is considered that Farmer Smith has earned a new quota which is 86 percent of his old one this principle should be clearly spelled out in the plan. Imports, the net costs of which are borne by a local underquota producer, cannot be considered as milk deliveries of that producer under the terms of the Bottled Milk Quota Plan and under the bylaws of the association which specify: "Any person of the Mid-South --- engaged in the dairy industry as a milk or cream producer and *not purchasing milk from other producers for resale* may become a member of this association ..."¹⁶

The opposite problem, that of prorating overquota Class I sales during the flush season also must be faced with the Memphis plan. Under the provisions of the Memphis plan, Class I sales in excess of quotas are to be blended with milk which must be disposed of at surplus prices in paying producers. Actually, the way the Mid-South Milk Producers Association met this problem from April to August 1948 was to increase all quotas by the approximate percentage by which Class I sales exceeded quotas. This procedure has the merit of rewarding the producers with a moderate proportion of overquota milk deliveries and of penalizing the producers with an excessive seasonal fluctuation in their production. For example, assume that Class I sales exceeded quotas by 5 percent. The producer who delivered 105 percent of quota and got the Class I price for all of his deliveries was obviously better off than if he had received a blend price for his 5 percent overquota deliveries. The producer who delivered, say, 150 percent of quota received the full Class I price for 5 percent of his overquota and a relatively low blend price for the remaining 45 percent. He would have been better off with a higher blend price for his entire overquota deliveries. Any producer whose percentage of overquota deliveries exceeded the percentage of overquota deliveries of all producers is worse off; any producer whose percentage of overquota deliveries is smaller than that of all producers gains under this procedure.

It has been pointed out that any conclusions based on this study must be tentative in view of the limited time the plan has been in operation. There is a further important limitation which should be kept in mind in evaluating the operations of a milk marketing plan such as the one under study. That is that its success depends at least as much on psychological factors as on economic soundness. An economically sound plan that enjoys no support is not workable. This fact should be kept clearly in mind by groups considering adopting the Memphis plan for their own markets.

The plan, no matter how sound, might break down completely if tried in another market where producers have not been sold on it beforehand and where the administration is in less skillful and competent hands than has been the case in Memphis.

¹⁶Italics added.

